

Claim Amendments

Amend the claims to read as follows:

1. A porous ceramic support for a gas separation membrane formed by sintering a green body containing refractory grains of at least one simple or compound ceramic oxide and grains of at least one reactive ~~binderbonding~~ precursor, comprising wherein:

a) refractory grains of at least one simple or compound ceramic oxide, wherein the coefficient of thermal expansion of the refractory grains is greater than about $8 \times 10^{-6}/^{\circ}\text{C}$.; and
b) grains of at least one reactive bonding precursor selected from the group of reactive bonding precursors consisting of metal elements and single cation ceramic oxides; wherein during sintering the grains of the reactive ~~binderbonding~~ precursor are reacted with each other or with at least one other gaseous, liquid, or solid phase reactant to form a reaction bond thatt~~e~~ binds the refractory grains; and
e) wherein the mean pore size of the support is greater than about 1 micron.

2. The support of claim 1 in which the support is sintered in an oxidizing atmosphere that oxidizes at least one reactive bonding precursor.

3. The support of claim 1 in which the support configuration is selected from the group consisting of multi-channel monoliths, tubular elements, hollow fibers, and plate structures.

4. The support of claim 1 in which the size of the refractory grains is in the range of about 5 to about 200 microns.

5. The support of claim 1 in which the refractory grains are selected from the group consisting of alumina, titania, zirconia, magnesia, forsterite, spinel, and mixtures thereof.

6. The support of claim 1 in which the change in volume of the sintered ceramic support from that of the green body is less than about 5%.

7. (canceled) The support of claim 1 in which the reactive binder precursor contains grains of an element.

8. The support of claim 7~~1~~ in which the element is selected from the group consisting of aluminum, silicon, titanium, zirconium, and mixtures thereof.

9. (canceled) The support of claim 1 in which the reactive binder precursor contains grains of at least one ceramic compound.

10. The support of claim 9~~1~~ in which the single cation ceramic oxide compound is selected from the group consisting of alumina, silica, titania, zirconia, and magnesia, ~~and carbides and nitrides of silicon, aluminum, zirconium, and titanium.~~

11. The support of claim 1 in which the grain size of the reactive bonding binder precursor is less than about 10 microns.

12. A porous, ceramic, multi-channel monolith gas separation membrane support formed by sintering a green body containing refractory grains of at least one simple or compound ceramic oxide and grains of at least one reactive ~~binder~~ bonding precursor, ~~comprising wherein:~~

a) refractory grains of at least one simple or compound ceramic oxide, wherein the

coefficient of thermal expansion of the refractory grains is greater than about

$8 \times 10^{-6}/^{\circ}\text{C}.$;

grains of at least one reactive bonding precursor selected from the group of reactive

bonding precursors consisting of metal elements and single cation ceramic oxides;

wherein during sintering the grains of the reactive bonding precursor react with each other or with at least one other gaseous, liquid, or solid phase reactant to form a reaction bond that binds the refractory grains;

- b) wherein the pore size of the monolith support is in the range of about 1 to 50 μm ; and
- e) wherein the volume change of the monolith support during sintering is less than about

5%.

13. A method of forming a porous membrane support of ceramic oxide material, comprising;

- a) making a mixture ~~comprising~~containing refractory grains of at least one simple or compound ceramic oxide with a coefficient of thermal expansion greater than about $8 \times 10^{-6}/^{\circ}\text{C}$. and grains of at least one reactive ~~binder~~bonding precursor selected from the group of reactive bonding precursors consisting of metal elements and single cation ceramic oxides;
- b) forming the mixture into a green body;
- c) sintering the green body to react the grains of the reactive ~~binder~~bonding precursor with each other or with at least one gaseous, liquid, or solid phase reactant to form a reaction bond to bind the refractory grains; and
- d) cooling the sintered body.